

A Pliocene Molluscan Faunule from Castle Point.

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The present paper describes a small collection of fossils collected by the writer in 1924 from the lighthouse reef at Castle Point, on the south-east coast of the North Island.

A hard band of fossiliferous limestone here runs out at a small angle with the coast and dips inland at 15° . The limestone reef forms a resistant barrier to the ocean and encloses behind it a moderate sized lagoon. The highest point of the reef, where the lighthouse is situated, is capped by an arenaceous layer, but along the lower and greater section of the reef this deposit has been weathered away by spray. Fossils are abundant in the hard limestone, but are difficult to extract. The arenaceous beds are equally rich, but with smaller species; and the area of this latter deposit is comparatively small. Although material is abundant, there is a striking paucity of species, only 35 being listed below, and of this number only 12 could be termed common. One very noticeable feature is the preponderance of pelecypods, the few gasteropods being almost without exception confined to the arenaceous layer.

The facies suggests shallow-water deposition subjected to moderately strong currents, at least during the formation of the reef, which is of tightly compacted shell debris with a smaller percentage of matrix. Silting followed, causing the formation of the arenaceous layer, and made way for typical sand dwelling genera such as *Alcithoe*, *Baryspira* and the several naticoids.

The first fossils to be recorded or described from these beds appeared in Hutton's 1873 "Catalogue of the Tertiary Mollusca," followed by Hector, 1886, in his "Outline of the Geology of New Zealand." In 1924 and 1926 respectively, Marwick published two further species.

The following is the first faunal list for the locality, but it is not considered representative, as the time available for collecting was only of a few hours duration.

CASTLE POINT FAUNULE.

Glycymeris (Grandaxinaca) wairarapaensis Powell n. sp.

A. *Limopsis marwicki* Powell n. sp.

Chlamys delicatula (Hutton 1873).

**Pallium (Mesopeplum) convexum* (Q. & G. 1835).

Pallium (Mesopeplum) cf. mariae (Finlay 1927).

Chama huttoni Hector 1886.

- **Limatula maoria* Finlay 1926.
 **Ostrea charlottae* Finlay 1928.
 **Venericardia purpurata difficilis* (Deshayes 1854).
 A. *Pleuromeris finlayi* Powell n. sp.
 A. *Pleuromeris hectori* Powell n. sp.
 A. *Pleuromeris murdochi* Powell n. sp.
 A. *Talabrica senecta* Powell 1931.
 **Dosinula crebra* (Hutton 1873).
 **Notocorbula zelandica* (Q. & G. 1835).
 A. *Argalista kingi* Powell n. sp.
 A. *Ataxocerithium* cf. *pyramidale* Finlay 1924.
Struthiolaria (Pellicaria) media Marwick 1924.
 A. *Lyroscila huttoni* (Suter 1915).
 **Maoricolpus rosea* (Q. & G. 1834).
 A.**Zeacolpus (Stiracolpus) symmetricus* (Hutton 1873).
 A. *Zeacolpus (Stiracolpus) waikopiroensis* (Suter 1917).
Maoricrypta cf. *wilkensi* Finlay 1924.
 †*Natica intracassus* Finlay 1924 (n.n. for *N. callosus* Hutton 1873).
 A. *Tanea planisuturalis* (Marwick 1924).
 A. *Proxibber anteaustralis* Powell n. sp.
 A. *Cominella (Cominula) hamiltoni* (Hutton 1885).
 A. *Buccinulum (Euthrena) wairarapaensis* Powell n. sp.
 A. *Austromitra* aff. *ambulacrum* (Marwick 1926).
 A. *Alciioe brevis* Marwick 1926.
 A.**Baryspira* cf. *mucronata* (Sowerby 1830).
 A.**Poirieria zelandica* (Q. & G. 1833).
 A. *Splendrillia acquistriata* (Hutton 1886).
 A. *Austrodrillia* cf. *exiguescens* Marwick 1931.
 A.**Bathytoma murdochi* Finlay 1930.
Dentalium cf. *solidum* Hutton 1873.

35 species: 11 Recent species (31.4%) (indicated *).

A=arenaceous upper layer.

†Although cited by Hutton as from Castle Point, it probably came from the "Taipo" beds in the neighbouring district.

The Castle Point faunule is difficult to correlate owing to the small number of species and the absence of index fossils. Marwick 1927 (Trans. N.Z. Inst., vol. 57, p. 575) has assigned this locality to the Nukumaruan, and the writer, after reviewing the evidence afforded by the present material, concurs with this conclusion.

ARCIDAE.

Genus GLYCYMERIS da Costa 1778.

Subgenus GRANDAXINEA Iredale 1931.

Type (by original designation): *Glycymeris magnificens* Iredale.

***Glycymeris (Grandaxinea) wairarapaensis* n. sp. Pl. 39, fig. 2.**

Shell large, very massive, well inflated, almost equilateral and narrowly subovate in outline. Sculpture consisting of from 36 to 39 convex well raised radial ribs with linear interstices. (The holotype has 36 radials). In adult specimens the radials become obsolete at the ventral margin. Hinge plate massive and narrowly arched, with a few strong anterior and posterior chevroned teeth, separated by a wide smooth space in the middle portion of the hinge plate. In the adult shell there are six anterior and the same number of posterior teeth. Ligamental area short and moderately deep, with six chevrons.

Height, 63.5 mm.; length, 60 mm.; thickness (one valve), 22 mm. (holotype).

Height, 39.5 mm.; length, 36.5 mm.; thickness (one valve), 13.5 mm. (paratype).

Height, 63.5 mm.; length, 63 mm.; thickness (one valve), 20 mm. (*laticostata*).

Height, 41.5 mm.; length, 42 mm.; thickness (one valve), 12.5 mm. (*laticostata*).

Holotype presented to the Auckland Museum.

Locality: Castle Point, in the limestone reef.

This species is intermediate between the Awamoan *monsardusta* Marwick 1932 and the Recent *laticostata*. The massive, narrowly arched hinge-plate and suboval, well inflated shell, are more in accord with the Awamoan species, but the radial ribs are more numerous and the ligamental chevrons considerably less. Also, even in senile specimens the Castle Point species is not nearly so high or so inflated at the beaks.

From *laticostata*, the Castle Point species differs in its constantly more oval and more convex shell, and in the massive and narrowly arched hinge-plate.

LIMOPSIDAE.

Genus LIMOPSIS Sassi 1827.

Type (Gray, 1847, p. 198): *Arca aurita* Brocchi.

Limopsis marwicki n. sp. Pl. 39, figs. 3, 4 and 5.

Shell small, obliquely-oval, moderately inflated, beaks low. Sculpture weak, consisting of concentric linear grooves which cut up the surface into flat, closely spaced interspaces, and are crossed by weak radials on and near to the anterior and posterior areas. These radials are produced into microscopic scale-like projections where they cross the lower edge of each interspace. Hinge typical. In young specimens the hinge teeth extend right across the hinge plate, but in the adults the teeth in the middle part of the hinge are sub-obsolete. The fully developed teeth number six on each extremity of the hinge. Ligamental area rather narrowly triangular. Valve margins smooth and bevelled.

Height, 11.5 mm.; length, 11 mm.; thickness (one valve), 3.25 mm. (holotype).

Height, 13 mm.; length, 12 mm.; thickness (one valve), 4 mm. (paratype).

Height, 8.5 mm.; length, 8.5 mm.; thickness (one valve), 2.5 mm (juvenile) (paratype).

Holotype: Presented to the Auckland Museum.

Locality: Castle Point. Arenaceous limestone, around lighthouse (common).

The species stands nearest to the Chatham Island (Oligocene *Limopsis invalida*, but differs from that species in outline, being less oblique and also in the considerably greater adult size. A specimen of *marwicki* the same size as the holotype of *invalida* is obviously a young shell, with the hinge teeth stretched right across the hinge line without the central subobsolete section. This young shell has 13 teeth at this stage, but in the adult there are 16 or 17, including the subobsolete middle ones. The hinge teeth in *invalida*, including the subobsolete ones, number 13 or 14, and the type has the character of an adult specimen, although the dimensions are only 7 mm. x 7 mm.

PECTINIDAE.

Genus PALLIUM Schumacher 1817.

Subgenus MESOPEPLUM Iredale 1929.

Type (by original designation): *M. caroli* Iredale.

Pallium (Mesopeplum) convexum (Q. & G. 1835).

1914 *Pecten (Pallium) burnetti* Suter (not of Zittel 1865), N.Z. Geol. Surv. Pal. Bull. No. 2, pl. 16, figs. 1a and 1b.

Although Suter (l.c.) selected a Castle Point specimen as a lectotype of Zittel's *Pecten burnetti*, the writer cannot find any essential differences between series of Castle Point specimens and Recent examples of *convexum*.

The type of *burnetti* is from Motupipi, near Takaka, Nelson Province, probably Hutchinsonian (Upper Oligocene). Judging from Zittel's figures, the type of *burnetti* is based upon two badly distorted and damaged specimens.

CARDITIDAE.

Genus PLEUROMERIS Conrad 1867.

Type (by monotypy) *Pleuromeris decemcostata* Conrad.

Pleuromeris hectori n. sp. Pl. 39, figs. 9, 10.

Shell moderately large, subcircular, subequilateral, beaks almost central, high and rounded. Lunule flattened, large, lanceolate and smooth. Escutcheon long and narrow, smooth. Sculptured with eighteen prominent broad, flattened, regularly beaded radial ribs with interspaces less than half the width of the ribs. Hinge of left valve with two strong divergent cardinals forming an angle of about 65°; both cardinals separated from the dorsal margins. Anterior and posterior laterals present. Hinge of right valve with a massive triangular median cardinal and anterior and posterior rudimentary cardinals. Anterior and posterior laterals present.

Height, 12.75 mm.; length, 12.5 mm.; thickness (one valve), 4 mm. (holotype).

Height, 13.5 mm.; length, 13 mm.; thickness (one valve), 4.5 mm. (paratype).

Height, 10.5 mm.; length, 11 mm.; thickness (one valve), 3.75 mm. (paratype).

Locality: Castle Point, arenaceous limestone around lighthouse.

Holotype: Presented to the Auckland Museum.

This species is allied to the Recent *zelandica* Deshayes, but larger, of different outline, being more rotund; differing also in sculpture, having more numerous ribs, which are broader and with narrower interspaces. There are two specimens of this species in the Finlay collection (Auckland Museum) from Petane, Hawke's Bay. The larger one measures:—Height, 14 mm.; length, 15 mm.; thickness (one valve), 4.5 mm.

***Pleuromeris murdochi* n. sp.** Pl. 39, fig. 6.

Shell small, narrowly ovate, inequilateral; beaks prominent, curved forwards, and situated at about the anterior third of the diameter. Sculptured with fifteen broadly rounded radial ribs with linear interspaces. The concentric growth lines do not cut the radials into beads; they are practically smooth. Hinge as in the Recent *marshalli* Marwick 1924, to which the species is probably ancestral.

Height, 5.75 mm.; length, 5.1 mm.; thickness (one valve), 1.75 mm. (holotype).

Locality: Castle Point, arenaceous limestone, around lighthouse.

Holotype: In writer's collection (Auckland Museum).

From *marshalli*, the new species differs in having more numerous radial ribs, with narrower, almost linear, interspaces. *Marshalli* has eleven radials with interspaces from one-third to a half their width.

***Pleuromeris finlayi* n. sp.** Pl. 39, figs. 7, 8.

Shell of moderate size, obliquely subcircular, beaks prominent, curved forwards and situated at about the anterior fourth in adults (in juveniles, which are less oblique, at the anterior third). Sculptured with prominently raised rounded topped radial ribs with interspaces equalling the ribs, except towards the ventral margin, where they are slightly wider. Radials faintly beaded by regular concentric growth lines. Hinge similar to that of *zelandica*, except that the median cardinal of the right valve is more broadly triangular and the anterior cardinal of the left valve is narrower.

Height, 11.25 mm.; length, 12.5 mm.; thickness (one valve), 3.5 mm. (holotype).

Locality: Inner Harbour (blue clays), Napier (Finlay collection, Auckland Museum) (holotype). One specimen (height, 7.8 mm.; length, 8.4 mm.; thickness (one valve), 2.5 mm.) from Castle Point, arenaceous limestone, around lighthouse.

The species differs from the Recent *zelandiae* in having more numerous radials (seventeen as compared with fourteen), in being somewhat oblique in outline, having a broader median cardinal in the right valve, as well as a narrower anterior one in the left, and in being a thinner shell.

TURBINIDAE.

Genus ARGALISTA Iredale 1915.

Type (orig. desig.): *Cyclostrema fluctuata* Hutton.

Argalista kingi n. sp. Text figs. 1 and 2.

Shell small, globose-turbinate, imperforate. Spire rather raised for the genus; about half height of aperture. Whorls four, including flattened, smooth protoconch. Post-nuclear whorls sculptured with flattened spiral cinguli, having linear interspaces. There are about ten cinguli at the end of the penultimate whorl, and on the body-whorl they continue over on to the base, but are absent from a broad zone surrounding the umbilical area. This zone is a shallow callused depression in the adult, but there is a definitely open and narrow umbilicus in younger shells. The basal lip is slightly effuse. Umbilical depression bordered by a slight fold bearing very weak crenulations. Aperture circular, comparatively small. Peristome thickening rapidly within the aperture.

Height, 2.5 mm.; major diameter, 2 mm. (holotype).

Locality: Castle Point, arenaceous limestone, around lighthouse.

Holotype: Presented to the Auckland Museum.

This species is nearest to the Awamoan *impervia* Finlay 1930, but it differs from that species in being more tightly coiled and in having more of an umbilical depression, although there is no true umbilicus in the adults of either species. Furthermore, the adult size of *kingi* is considerably smaller than in the Awamoan species.

NATICIDAE.

Genus PROXIUBER Powell 1933.

Type (by original designation): *Lunatia australis* Hutton.

Proxiuber anteaustralis n. sp. Text fig. 3.

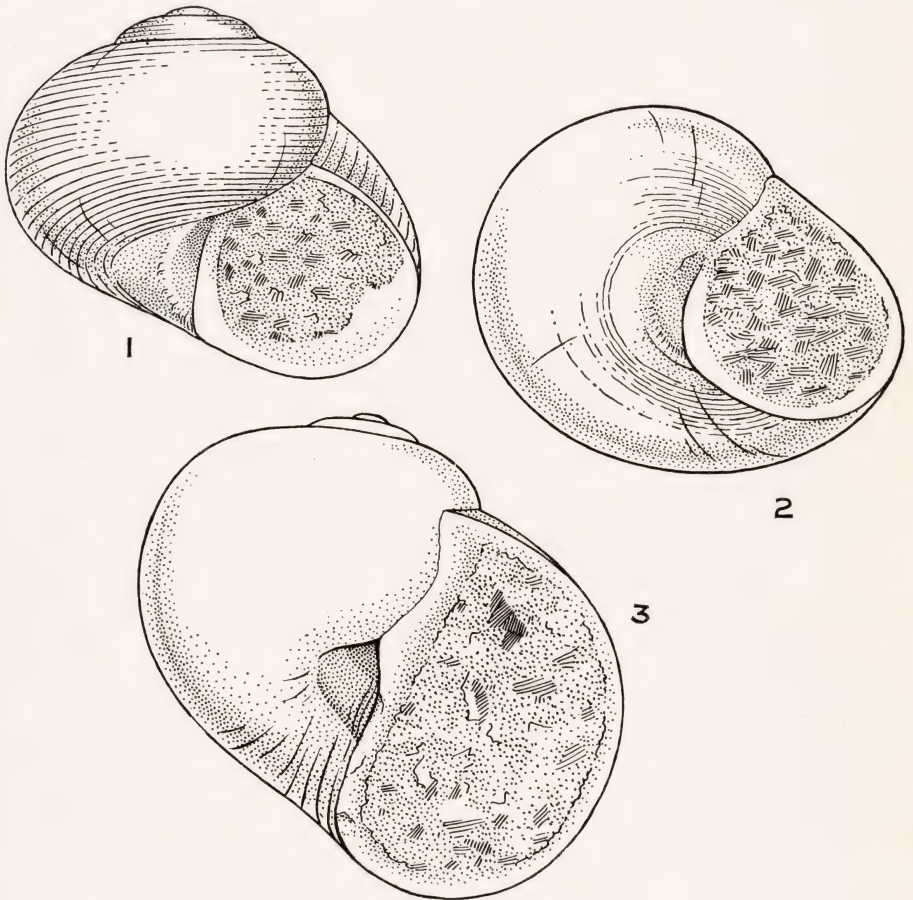
Shell small, broadly ovate; spire very little raised, about one-fifth height of aperture. Whorls 4, including smooth blunt protoconch of 1½ whorls. Sutures well marked, abutting. Surface

without sculpture except for indistinct axial growth lines. Outline of whorls strongly and evenly convex, but slightly flattened below suture. Aperture semilunar. Umbilicus widely open about one-sixth width of shell, funicle undeveloped, merely defined below by a groove. Inner lip callus thickened and slightly encroaching upon the umbilicus from above.

Height, 5.1 mm.; diameter, 5.8 mm. (holotype).

Holotype: In writer's collection (Auckland Museum).

Locality: Castle Point, arenaceous limestone, around lighthouse.



Although the operculum of this species is unknown, the sub-obsolete funicle indicates relationship with *Proxiuber* rather than with *Uberella*, which has the funicle entirely wanting.

From *australis* the Castle Point species differs in being considerably broader and more compressed, and in having a considerably wider and more open umbilicus. Marwick (1924, Trans. N.Z. Inst., vol. 55, p. 552) mentioned a variant of *australis* from the Pliocene of Petane, Castlecliff, and Kai Iwi, in which the

umbilicus is wider than in Recent shells. However, the Castle-cliff and Kai Iwi specimens examined by the writer have the same outline as *australis*, but that of the Castle Point species, as mentioned above, is much more depressed and broadly ovate.

BUCCINULIDAE.

Genus BUCCINULUM Swainson 1837.

Subgenus EUTHRENA Iredale 1918.

Type (orig. desig.): *Fusus vittatus* Q. & G.

Buccinulum (Euthrena) wairarapaensis n. sp. Pl. 39, fig. 11.

Shell of moderate size, solid, prominently spirally ridged and axially costate. Number of whorls probably five (apex eroded). Spire a little taller than height of aperture plus canal. Outline of spire convex, but with a concave shoulder occupying the upper third of the whorls. Spiral sculpture of six rounded cords on spire whorls, two of which are on the shoulder; each with an interstitial thread. Thirteen spirals on the body whorl, becoming stronger over the base, the interstitial thread being augmented by still finer spiral lirae. Fasciole rounded, devoid of spiral ribbing and not marked off from the base by a ridge. Axials regular, fold-like, not extending over the base; twelve on the penultimate whorl. Outer lip broken. Inner lip with a weak denticle on the parietal callus near to the posterior notch. Aperture spirally lirate within.

Height, 18 mm. (actual), 19 mm. (estimated); diameter, 9 mm. (holotype).

Holotype: In writer's collection (Auckland Museum).

Locality: Castle Point, arenaceous limestone, around lighthouse (one specimen).

The fossil species differs from the Recent *colensoi* in having stronger axial and spiral sculpture and a decidedly concave shoulder.



Castle Point, south-east coast of North Island, showing fossiliferous limestone reef. The arenaceous layer extends from the lighthouse to the flagstaff.

L. H. Lytle photo

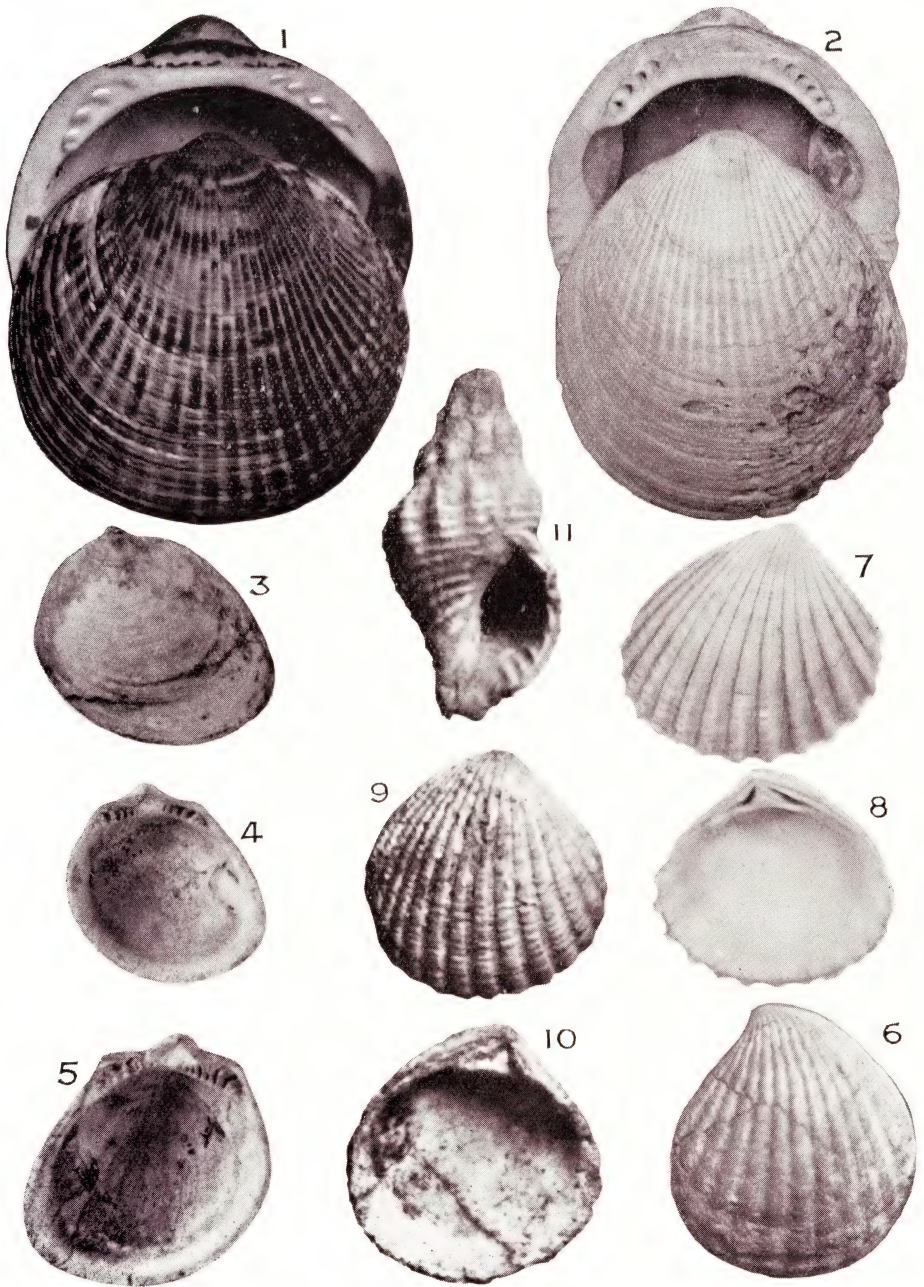


Fig. 1. *Glycymeris (Grandaxinaca) laticostata* (Q. & G. 1835). Recent, Auckland.
 Fig. 2. *Glycymeris (Grandaxinaca) wairarapaensis* n. sp.
 Figs. 3, 4, 5. *Limopsis marwicki* n. sp.
 Fig. 6. *Pleuromeris murdochi* n. sp.
 Figs. 7 and 8. *Pleuromeris finlayi* n. sp.
 Figs. 9 and 10. *Pleuromeris hectori* n. sp.
 Fig. 11. *Buccinulum (Euthrena) wairarapaensis* n. sp.